GRANDFATHER TELLS THE STORY OF INK

ONE EVENING, after Dick had finished his home work, he lay on the rug before the fire-place watching the starlike sparks fly up the chimney. Beside him lay Prince, his big police dog. Prince had such beautiful eyes and he seemed to understand everything Dick said to him.

Suddenly Prince raised his silken ears as a familiar step was heard on the porch. The front door opened and in walked Dick's grandfather. It was a treat to have grandfather come because he always had a story to tell about what he did when he was a boy. Tonight he drew from one of his pockets a bag of chestnuts to roast in the fire.

"Grandfather," asked Dick, while they waited for the chestnuts, "do you think that thousands and thousands of years ago, boys and girls worked arithmetic problems?"

"Yes," answered Dick's grandfather. "In ancient times the first problems of arithmetic and astronomy were carved on stone because the people had no paper and ink. In Egypt the obelisks and royal tombs were covered with symbols which only a few priests and wise men would read. Later these Egyptians made a crude paper called papyrus, and they were pleased to find they could mark on it with juice pressed from berries and roots.

"Meanwhile, other races in distant parts of the world were trying to find some way of putting their language in writing. The Chinese made odd little brushes by tucking wisps of hair in a reed. They dipped these in a black liquid, made by dissolving particles of soot and carbon scraped from their stone ovens. The Indians wrote on their wigwams with brilliantly colored juices pressed from vegetables and tree bark, much as you write on a blackboard. Every decoration on wigwams, pottery or basket, had some meaning.

"The Romans discovered that when the cuttlefish, which is something like an octopus, became frightened he discharged a black fluid that beclouded the water so his enemies could not pursue him. They caught these fish and found the black liquid, stored in a little sac, could be used for writing. So precious was this writing fluid that often the kings and emperors would place a man on guard over the vase which contained it.

"In those days there were no telephones or railroads, and if one emperor wished to send word to another, he chose a very brave messenger because it was necessary to travel for many days through jungles and mountains. Even though the messenger sometimes lost his horse or his food on this dangerous mission, he knew he must hide the note safely in his clothing until he reached his destination.

"So you see, Dick, how necessary it has always been to have a means of preserving records. In George Washington's time, not only did the people spin cloth and make soap, but each household made its own ink, using oils and lampblack. The pens were goose quills or raven quills, and after writing a few lines sand was shaken on the paper to help the ink dry.

"As the colonies grew, these industries were gradually taken from the home to small shops. These shops were the modest beginnings of our large factories.

"There was vast improvement made in some products from the time I was a small boy," continued grandfather, "but not in ink. For many years this industry stood still. One day a man who owns a large pen factory made up his mind that something must be done to give the people all over the world a perfect ink, an ink which would flow freely, keeping the pen point moist and yet dry the instant it came in contact with the paper.

"He took this problem, which seemed

almost impossible of solution, to a laboratory in a large city where many men, called chemical engineers, work day and night searching for better ways to make things. These men, who are accustomed to doing very difficult experiments, worked patiently for many long months. The months became two years and, after 900 kinds of ink had been made, only disappointment met their efforts.

"Still a third year went by when one day, as they were working on the thousand twenty-first formula, lo and behold a chemical was discovered which made the secret combination! The ink remained moist on the metal pen but dried quickly as it touched the paper!"

"My!" cried Dick, eyes wide with curiosity. "How much did it cost to have those chemists work such a long time?"

"The manufacturer paid the men $68,000 to reward them for their hard work," answered the grandfather.

"I know you wonder sometimes why it is necessary to work difficult problems like these," said grandfather, as he pointed to Dick's arithmetic, "but your mind is being trained so that when you go out into the world you will be able to solve more difficult problems.

"Instead of saying, 'Oh, that's too hard —I can't do it', remember the story of these chemists who tried patiently for three long years to solve one problem. Suppose they had become discouraged after trying one thousand twenty times when just one more trial meant success!"

"What did they name this ink?" inquired Dick.

"Many names were suggested," replied grandfather. "Because it is such quick drying ink they call it 'Quink'."

"Oh!" cried Dick, "That is the new ink my father likes. He says it dries so quickly on paper, yet the pen in his desk set at the office never gets dry."

"So, the story of ink contains a romance. The coloring matter that comes from the four corners of the earth, the chemicals that are the result of chemistry research, understanding how to combine chemicals in the proper quantities to produce an ink that is far better than that when I was a boy, for this ink will not clog a pen, it will dry quickly on the paper on account of the chemical reaction and yet it will stay moist on the point of the pen."

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